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XXVII.—*A Contribution to the Systematics of the Pedipalpi.*  
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### Part I.—A REVISION OF THE GENERIC NAMES OF THE AMBLYPYGI.

THE first name introduced into the group of Amblypygous Pedipalpi was *reniforme*, Linn., which was assigned to the genus PHALANGIUM (Syst. Nat. ed. 10, p. 619, 1758). *Reniforme* was based upon—(1) a specimen in the Mus. Ludov. Ulr. and indicated in the description by the letters M. L. V.; (2) a figure and description of a Pedipalp from Antigua published in Browne's 'History of Jamaica.' The specimen and the figure are representatives of totally distinct species. To which is the name *reniforme* to be affixed?

In the case of a genus based upon two species which subsequently prove to be generically distinguishable it is customary, in deciding to which of the two the generic name is to be attached, to abide by the verdict of the first reviser who fixes the type species either by direct selection or by elimination. Species should be similarly treated.

In the case of *reniforme*, Linnæus was his own reviser, for in the catalogue of the Mus. Ludov. Ulr. p. 427 (1764) he gives a description of *reniforme* taken from the actual specimen, and this description obviously excludes the species

depicted in the 'History of Jamaica.' Hence this specimen must be regarded as the type of *reniforme*. The species it belongs to is now known to occur in Ceylon.

In 1772 (Spic. Zool. pt. 9, pp. 33-37) this Ceylonese species was recharacterized as *Phalangium lunatum* by Pallas, and in the same work appear a figure and description of a South-American species believed, though erroneously, to be *reniforme* of Linn.

In 1792 (Ent. Syst. ii. p. 43) Fabricius established his genus TARANTULA upon three species, namely, *Phalangium reniforme*, L., *caudatum*, L., and *lunatum*, Pall. He did not, however, discover that Pallas had renamed *reniforme*, L.; and for the latter species he takes a form which may be considered to be specifically identical with the Antigua specimen figured and described by Browne. His description plainly tells so much, and the specimen he described is said to be still in the Museum of the Kiel University.

TARANTULA, then, was based upon the following species, any one of which might be its type:—

1. A species, wrongly named *Phalangium reniforme*, L., and identified with Browne's figure.
2. *Phalangium caudatum*, Linn.
3. *Phalangium reniforme*, Linn. (= *lunatum*, Pall.).

In 1797 the species included under no. 1 (i. e. *reniformis*, Fabr.) was described as *palmatus* by Herbst (Nat. ungeflügelt. Ins. i. p. 82).

In 1801\* Lamarck (Syst. Anim. p. 175) based the genus *Phrynus* upon the following two species:—(1) *Tarantula reniformis* as restricted by Fabricius, (2) *Tarantula caudata* (Linn.). It is significant that he omits all mention of *lunata*, Pall., and all reference to the example in Mus. Ludov. Ulricæ. Hence the genuine *reniformis*, Linn., formed no part of the genus *Phrynus* as first constituted, and Lamarck's elimination of *caudata*, L., and *reniformis* (L.), Fabr., from TARANTULA fixes the latter name upon the third and last species included in that genus, namely *reniformis*, L. (= *lunata*, Pall.).

In 1802 Lamarck's PHRYNUS was subdivided by Latreille (Hist. Nat. Crust. Ins. iii pp. 47 & 48), who took *caudatus* out of it as the type of his new genus *Thelyphonus*, and thus left *reniformis*, Fabr., as the type of *Phrynus*. It is significant,

\* *Phrynus* does not date from Latreille, 1802, as I have already pointed out (Ann. & Mag. Nat. Hist. (6) xiv. p. 274, 1896). Kraepelin repeats the old error of ascribing it to Latreille, 1802, in Das Tier., Scorp. &c. p. 241 (1899).

too, that Latreille carefully cites *reniformis*, Fabr., not *reniformis*, Linn. or Pall., as the "exemple" of *Phrynus*.

Thus with regard to the two species of *Amblypygi* under discussion the method of settling type-species by elimination gives the following results:—

1. *reniformis*, Linn. (= *lunatus*, Pall.), comes out as the type of TARANTULA by Lamarck's elimination under *Phrynus* of *caudatus* and the species wrongly called *reniformis* by Fabricius.
2. The latter comes out as the type of *Phrynus* by Latreille's removal of *caudatus* under *Thelyphonus*.

The next author to take up the genera of the group was C. Koch in 1850 ('Uebersicht,' &c. v. p. 81). He arranged them as follows:—

1. PHRYNUS, to include *ceylonicus*, Koch; *lunatus*, Pall.; *nigrimanus*, Koch; *medius*, Herbst.
2. DAMON, nov., for *variegatus*, Perty; *reniformis*, L., as erroneously restricted by Pallas.
3. ADMETUS, nov., for *pumilio*, Koch; *palmatus*, Herbst; *fuscimanus*, Koch; *marginemaculatus*, Koch.

*Phrynus*, however, was already restricted by Latreille to *reniformis*, Linn., as restricted by Fabricius. Hence Koch's application of the name was inadmissible. For *Damon* and *Admetus* any one of the species cited under them might come out as the type.

In 1879 (Arch. Naturg. p. 197) Karsch proposed the following systematic arrangement:—

1. PHRYNICHUS, nov. Type *reniformis*, Linn. (= *lunatus*, Pall.).
2. DAMON, Koch. Type *medius*, Herbst (= *variegatus*, Perty).
3. TARANTULA, Fabr. Type *pumilio*, Koch (= *reniformis*, Pallas, nec Linn.).
4. CHARON, nov. Type *Grayi*, Gerv.

For the first name *Phrynichus*, *reniformis*, Linn. (= *lunatus*, Pall.) is cited as the type. But since this species is also the type of *Tarantula*, Fabr., as already pointed out, *Phrynichus* falls as a synonym of *Tarantula*. It will be observed that Karsch reverses the action of Pallas and Fabricius, and rightly makes the species exemplified by the specimen in the Mus. Ludov. Ulr. the type of *reniformis*.

The second name DAMON is restricted to *variegatus*, the supposition that *medius*, Herbst, is identical with *variegatus* being erroneous.

The third name TARANTULA is assigned to a species originally included in the genus as a synonym. But the name was already taken up for *reniformis*, Linn.: hence the

restriction is null and void. Karsch regarded *Phrynus* and *Admetus* as synonyms of *Tarantula* as restricted by himself.

CHARON stands as defined and does not further concern my present purpose.

In the Ann. Soc. Ent. Fr. lxi. pp. 45-52 (1892) appeared Simon's classification. He adopts Karsch's nomenclature with two exceptions. He shows that the genus *Tarantula* as recognized by Karsch is divisible into two genera. He restricts *Tarantula* to *pumilio* as Karsch had done, and for the second he rightly takes *Admetus* of Koch, citing *palmatus*, Herbst, as its type. In the second place he follows Pallas, Herbst, and Koch in their determination of *reniformis*, Linn., which brings that species out as the type of *Tarantula*.

In Ann. & Mag. Nat. Hist. (6) xiv. pp. 274-298 (1894), I returned to Fabricius's determination of *reniformis*, Linn., and applied the name to a West-Indian species from Antigua. This species was made the type of the genus *Tarantula*, Fabr., on the assumption that *Tarantula* and *Phrynus* were strictly synonymous. Moreover, although I overlooked the fact that Simon had selected *palmatus* as the type of *Admetus*, nevertheless I assigned *Admetus* to the synonymy of *Tarantula* + *Phrynus*. Also I showed that the genus called by Karsch and Simon *Tarantula* was nameless, and proposed for its reception the term *Heterophrynus*, with *chiracanthus*, Gerv., as the type. This name will stand. For *lunatus*, Pall., Karsch's name *Phrynichus* was kept.

The type species of the other genera established in this paper are clearly stated and need not be further discussed.

The innovations proposed by Kraepelin (Abh. nat. Ver. Hamb. xiii. pp. 3-51, 1895) come next in order. He followed Karsch's determination of *reniforme*, Linn., and, holding that *reniforme* must be the type of *Tarantula*, used this generic name in place of *Phrynichus*, Karsch. In the second place, overlooking Simon's selection of *palmatus* as the type of *Admetus*, he proposed *Neophrynus* for this same species.

And, lastly, in 1899 ('Das Tierr.,' Scorp. et Pedipalpi) Kraepelin makes still further changes. He discovered, what, indeed, is pretty clear from the diagnosis, that Fabricius's specimen of *reniformis* was identical with, or at least closely allied to, the specimen subsequently described as *palmatus* by Herbst, and, holding that the species represented by this specimen must be the type of *Tarantula*, he retransferred *Tarantula* to the West-Indian species, with *Phrynus* and *Neophrynus* as synonyms. *Phrynichus* he readopts for *reni-*

*formis*, Linn. (= *lunatus*, Pall.), and ignoring Simon's legitimate restriction of *Admetus*, he brings this name up for the species I had assigned to *Heterophrynus*, selecting *pumilio* as the type.

The results arrived at may be briefly summarized as follows, the genera being arranged systematically under family headings equivalent to the subfamilies proposed by Simon:—

#### Family Phrynidæ, nov.

*Tarantulinæ*, Sim., Poc., 1894; Kraepelin, 1899.

*Neophryninæ*, Kraepelin, 1895.

*Admetinæ*, Poc., 1897.

#### Subfam. PHRYNINÆ, nov.

Genus PHRYNUS, Lamarck, as restricted by Latreille (nec *Phrynus*, Koch). Type *palmatus*, Herbst.

Syn. *Admetus*, Koch, as restricted by Simon. Type *palmatus*, Herbst.

*Neophrynus*, Kraep. Type *palmatus*, H.

Genus HEMIPHRYNUS\*, nov. Type *lævifrons*, Poc.

ACANTHOPHYNUS, Kraep. (= *Phrynopsis*, Poc., præocc.).

Type *spinifrons*, Poc.

#### Subfam. HETEROPHYRININÆ, nov.

Genus HETEROPHYRINUS, Poc. Type *chiracanthus*, Gerv.

Syn. *Tarantula*, Karsch, type *pumilio*, Koch; Simon, type *reniformis*, Pall., nec Linn.

*Admetus*, Kraep., 1899, type *pumilio*, Koch; nec *Admetus*, Sim., type *palmatus*, Herbst.

#### Family Tarantulidæ.

*Phrynichinæ*, Sim., Poc., Kraep., 1899.

*Tarantulinæ*, Kraep., 1895.

Genus TARANTULA, Fabr. Type *reniformis*, Linn.

Syn. *Phrynus*, Koch (ad max. part.).

*Phrynichus*, Karsch, Simon (*Phryniscus*), = Poc., Kraep., 1899.

Type *reniformis*, L.

*Tarantula*, Kraep., 1895.

Genus DAMON, Koch. Type *variegatus*, Perty.

Syn. (sec. Kraep.). *Nanodamon*, Poc. Type *annulatipes*, Wood.

Genus TITANODAMON, Poc. Type *Johnstoni*, Poc.

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\* For the species diagnosed under heading *a* in Ann. & Mag. Nat. Hist. (6) xiv. p. 276 (1894).

## Family Charontidæ.

*Charontinæ*, Sim., Kraep., Poc.Genus CHARON, Karsch. Type *Grayi*, Gerv.STYGOPHRYNUS, Kraep. Type *cavernicola*, Thor.CHARINUS, Sim. Type *australianus*, Koch.SARAX, Sim. Type *brachydactylus*, Sim.CATAGEUS, Thor. Type *pusillus*, Thor.

## Part II.—DESCRIPTIONS OF SOME NEW SPECIES.

## Family Phrynidæ.

Genus HETEROPHRYNUS, Poc.

*Heterophrynus armiger*, sp. n.

Normally coloured and granular. *Ocular tubercle* and *lateral eyes* exceptionally high.

*Chelæ* shorter and stouter than in any species hitherto described; trochanter normally spined; femur covered above with five spines, the fifth standing near the middle of the distal half of the segment; the lower side armed with five spines, the first and second long, not very unequal, the third small, slender, about half the length of the second, and a little less than its own length from it, and about as long as the fifth, the fourth noticeably shorter than the second, the fifth near the middle of the distal half of the segment; tibia armed above with six spines, the first standing about midway between the base of the segment and the proximal of the three long spines; fifth and sixth spines small and slender, subequal, both of them shorter than the first; lower side of this segment armed with six spines, of which the first, second, third, fifth, and sixth represent the second to the sixth of *longicornis*, *chiracanthus*, and the first to the fifth of *cervinus*, the fourth from the proximal end being supernumerary and inserted between the normal third and fourth spines; the penultimate spine of this series is as thick and about twice as long as the last, and slightly thicker than and almost as long as the third spine from the distal end, which is the longest of the series.

*Hand* spined as in the other species, the distal half of the external surface quite smooth, except the edges, which are very finely denticulated, the proximal half up to the root of the long spines dull and studded with coarse granules.

*Measurements in millimetres.*—♂. Total length 34; width of carapace 16.5, its median length 11.5; length of femur of

chela (along upperside) 17·5, of tibia 20, of hand 8; femur of first leg 54, of fourth leg 28.

*Loc.* Pambelar in Ecuador.

One male and two female examples. The length of the chelæ is substantially the same in the two sexes.

In the spine-armature and form of the chelæ this species stands midway between the previously known species of this genus and the following species, which would otherwise have strong claims to rank as a distinct genus.

*Heterophrynus alces*, sp. n.

♀ (adult).—A uniform reddish-brown colour.

*Carapace* finely and closely granular, studded with coarse granules as well; the anterior border straight, denticulated; ocular tubercle with a pair of granules above, about its own diameter from the frontal border; lateral clusters not widely separated, the distance between them equal to about one third the greatest width of the carapace, considerably nearer to the middle line than to the anterior or lateral border.

*Chelæ* short; tibia only a little longer than the median length of the carapace, much less than its width; trochanter armed with four spines, femur with five above and five below on the margin, as in *H. armiger*; the second on the upperside erect, the fourth on the underside much longer than the third or fifth, which are subequal, the first inferior about equal to the height of the segment, the longest of the upper spines much less; base of femur furnished with a strong additional spine above the two long inferior spines, exactly as in the genus *Acanthophrynus*; tibia armed above with six spines, below with five, the longest upper spine only a little exceeding the height of the segment and considerably more than one third of its length; the first, fifth, and sixth not very unequal in length, the first a little the smallest, third as long as the second or fourth; hand with two upper and two under spines, the latter subequal; chelæ coarsely and finely granular, except the hand, which has only a few granules externally and beneath in its basal half.

*Measurements in millimetres.*—Total length 22; width of carapace 12, median length 7·5; length of tibia of chela 9, width 3·5; of femur of first leg 22, of fourth leg 15.

*Loc.* Upper Surinam River (*C. W. Ellacombe*).

Differing from the remaining species of *Heterophrynus* in the presence of a strong spine upon the base of the femur of the chela in front above the long proximal inferior spine, as in *Acanthophrynus*, and in the form of the chelæ, which are

short, robust, and without any noticeable external curvature on the tibia, approaching what is seen in the genus *Phrynus*.

- a. Chelæ short and thick, like those of *Phrynus*, the tibia scarcely bowed; femur armed basally in front with a strong spine standing above the two normal long spines, as in *Acanthophrynus*; the two inferior spines on the hand subequal; the rest of the spine-armature of the chela substantially as in *H. armiger*. *alces*, sp. n.
- b. Chelæ variable in form and length; no spine on base of femur in front above the long inferior spines; second spine on lower side of hand much longer than the first.
- a<sup>1</sup>. An additional spine present upon the femur of the chela between the second and third long spines and one on the inferior edge of the tibia between the second and third long spines from the distal end; the two distal spines on the upperside of the tibia small, weak, and subequal; the penultimate spine on the tibia below much longer and stronger than the ultimate, and subequal to the longest spine along this margin ..... *armiger*, sp. n.
- b<sup>1</sup>. No supernumerary spine between the second and third long spines on the lower edge of the femur, and none between the second and third long spines from the distal end on the tibia .... *chiracanthus*, Gerv.; *longicornis*, Butl.; *Batesii*, Butl.; *cervinus*, Poc.\*

### Family Thelyphonidæ.

#### Genus TYPOPELTIS, Poc.

#### *Typopeltis Turnanii*, sp. n.

♂.—Very closely related to *T. Dalyi*, Pocock (Ann. & Mag. Nat. Hist. (7) v. p. 297, 1900), from Lacan, near Raheng, in Siam. The trunk, the chelæ, and anterior portion of the carapace more granular. *Trochanter* of chela with or without one small tooth in the middle of its straight upper edge, the angular tooth represented merely by a blunt prominence, immediately below which on the inner side there are two small sharp spines. *Tibial apophysis* with two or three

\* For diagnoses of these species see Ann. & Mag. Nat. Hist. (6) xiv. p. 287.



sharp spinules in front at the base, strongly geniculate, with a triangular expansion at the apex, the anterior side of the angle the longest and armed with six teeth, the posterior side with one tooth; when the anterior side of the angular expansion closes against the immovable finger the tip of the movable finger considerably surpasses its posterior side; inner edge of hand lightly convex, without trace of any basal prominence, with four strong and some smaller teeth; inner surface of hand without any distinctly depressed or hollowed area on its inner side just below the denticulated crest.

Total length 44 millim.; carapace 25; chela (not including coxa) 26.

*Loc.* Lampun, N. Siam (*M. Daly*).

Two male examples of this species were collected with one of *T. Dalyi*. The chief difference between the two forms lies in the much smaller size and different shape of the tip of the tibial apophysis and the absence of excavation on the inner surface of the hand in *T. Tarnanii*.

## XXVIII.—*Descriptions of new Eastern and Australian Moths.*

By Colonel C. SWINHOE, M.A., F.L.S., &c.

### Family Limacodidæ.

#### *Thosea luxa*, nov.

♂. Of a uniform grey colour, some examples tinged with ochreous, some with pale olive; shaft of antennæ dull red, the pectinations red-grey: fore wings with a central thin brown band from hinder margin a little before the middle, stopping short of the costa a little beyond the middle; a brownish spot in the centre of the disk; in some examples the band is more or less obsolete, in others the spot is obsolete, but all have indications of one or the other: the hind wings and the underside are without any markings, the underside is tinged with red.

♀. Without the discal spot in all the three examples before me, the transverse central band more or less marked.

Expanse of wings, ♂ 1, ♀  $1\frac{2}{5}$  inch.

Sherlock River, W. Australia (*Clement*).

Types in B. M.